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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/028,787	12/28/2001	Satoshi Niiyama	217911US0CIP	2834
22850	7590	08/09/2005	EXAMINER	
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			DUONG, THOI V	
			ART UNIT	PAPER NUMBER
			2871	

DATE MAILED: 08/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/028,787

Applicant(s)

NIIYAMA ET AL.

Examiner

Thoi V. Duong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 May 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 11-23, 27 and 28 ~~is/are~~ pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 11-23, 27 and 28 ~~is/are~~ rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. This office action is in response to the Amendment filed May 13, 2005.

Accordingly, claims 9, 10 and 24-26 were cancelled. Currently, claims 1-8, 11-23, 27 and 28 are pending in this application.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 2, 11-13, 18 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by West et al. (West, USPN 5,453,863).

Re claim 1, as shown in Fig. 1, West discloses a chiral nematic liquid crystal optical element, comprising:

a pair of substrates 10 and 11 with transparent electrodes 13 (col. 6, lines 35-39);

and

a liquid crystal layer 16 having a memory property interposed between the substrates (col. 4, lines 25-35);

a first resin layer 14 (upper resin layer) which is provided on one of the transparent electrodes, the upper transparent electrode 13 in Fig. 1 (col. 6, line 66 through col. 7, line 9),

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said first resin layer having a rubbed vertical alignment surface in contact with the liquid crystal layer 16 (col. 5, lines 36-44; col. 9, Table II, examples 18 and 23 and Table III, examples 33 and 36; and col. 14, lines 35-37);

a non-alignment layer of a second resin layer 14 (lower resin layer), a vertical alignment layer of a second resin layer or a horizontal alignment layer of a second resin layer which is provided between the liquid crystal layer and the other of the transparent electrodes, the lower transparent electrode 13 in Fig. 1 (col. 9, Table II, examples 16-20, 22 and 23 and Table III, examples 31-37; and col. 14, lines 35-37),

wherein said liquid crystal layer exhibits a planar state as shown in Fig. 4 and a focal conic state as shown in Fig. 3 (col. 10, lines 42-59),

wherein, re claim 2, the first resin layer is provided only on the substrate on a side opposite to an observing side (upper side of Fig. 1);

wherein, re claim 11, said focal conic state produces a scattering of incident light (col. 9, line 63 through col. 10, line 62);

wherein, re claim 12, said planar state produces a selective reflection of incident light (col. 9, line 63 through col. 10, line 62).

Re claim 13, the liquid crystal optical element of West et al. is a color display (col. 2, lines 10-13).

Re claim 18, the liquid crystal layer exhibits reflection characteristics as if the liquid crystal layer is a mirror (Fig. 4 and col. 10, lines 43-51).

Re claim 27, the rubbed vertical alignment does not twist the liquid crystal at 240 degrees since, according to examples 17 and 18 in Table II where the PVF coatings on

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opposites substrates are rubbed parallel and perpendicular to each other, the rubbed vertical alignment surface twists the liquid crystal at 90 degrees or 270 degrees.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 5, 23 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over West et al. (West, USPN 5,453,863) in view of Konuma et al. (Konuma, USPN 5,856,853).

Re claim 5, as shown in Fig. 1, West discloses a chiral nematic liquid crystal optical element, comprising:

a pair of substrates 10 and 11 with transparent electrodes 13 (col. 6, lines 35-39);

and

a liquid crystal layer 16 having a memory property interposed between the substrates (col. 4, lines 25-35);

a first resin layer 14 (upper resin layer) which is provided on one of the transparent electrodes, the upper transparent electrode 13 in Fig. 1 (col. 6, line 66 through col. 7, line 9),

said first resin layer having a rubbed vertical alignment surface in contact with the liquid crystal layer 16 (col. 9, Table II, examples 18 and 23; and Table III, examples 33 and 36)

a non-alignment layer of a second resin layer 14 (lower resin layer), a vertical alignment layer of a second resin layer or a horizontal alignment layer of a second resin layer which is provided between the liquid crystal layer and the other of the transparent electrodes, the lower transparent electrode 13 in Fig. 1(col. 9, Table II, examples 16-20, 22 and 23; and Table III, examples 32-37),

wherein said liquid crystal layer exhibits a planar state as shown in Fig. 4 and a focal conic state as shown in Fig. 3 (col. 10, lines 42-59);

wherein, re claim 23, the liquid crystal layer exhibits reflection characteristics as if the liquid crystal layer is a mirror (Fig. 4 and col. 10, lines 43-51); and

wherein, re claim 28, the rubbed vertical alignment does not twist the liquid crystal at 240 degrees since, according to examples 17 and 18 in Table II where the PVF coatings on opposites substrates are rubbed parallel and perpendicular to each other, the rubbed vertical alignment surface twists the liquid crystal at 90 degrees or 270 degrees.

West discloses a chiral nematic liquid crystal optical element that is basically the same as that recited in claim 5 except for a metal oxide layer provided on at least one of the transparent electrodes.

As shown in Fig. 1, Konuma discloses a transparent electrode 8 and a metal oxide film 9 provided on the transparent electrode 8 to prevent short-circuiting between electrodes (Abstract).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the chiral nematic liquid crystal optical element

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of West with the teaching of Konuma by providing a metal oxide layer provided on at least one of the transparent electrodes to prevent short-circuiting between electrodes (Abstract).

6. Claims 3, 4, and 14, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over West et al. (West, USPN 5,453,863) in view of JP 08-220326 (JP'326).

Re claims 3 and 4, West discloses a liquid crystal optical element that is basically the same as that recited in claims 3 and 4 except that the surface hardness of the second resin layer is not disclosed.

JP'326 discloses a polyimide contact layer having a pencil hardness of less than HB formed on a color filter substrate to improve adhesion property and maintain high transparency (See Abstract, Table 1 and paragraph 47).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the liquid crystal optical element of West with the teaching of JP'326 by forming on the other electrode a second resin having a surface hardness of B or less to improve adhesion property and maintain high transparency for the display (see Abstract).

Re claim 17, according to Table 1 of the current invention, the resin layer having a pencil hardness of B or less prevents image-sticking, thus, it is obvious that the resin layer of JP'326 having a pencil hardness of less than HB also prevents image-sticking.

Re claim 14, the resin layer of JP'326 comprises a polyimide as indicated above. However, as to the product-by-process limitation "a polyimide which has been baked," it

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has been recognized that "Even through product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior art product was made by a different process". *In re Thorpe*, 227 USPQ 964,966 (Fed. Cir. 1985). See also MPEP 2113.

Re claim 16, West discloses that the resin layer may be a non-alignment layer of a resin surface since it is unrubbed (col. 7, lines 2-7).

7. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over West et al. (West, USPN 5,453,863) in view of Konuma et al. (Konuma, USPN 5,856,853) as applied to claims 5 and 23 above and further in view of Gotoh et al. (Gotoh, USPN 5,674,576).

The chiral nematic liquid crystal optical element of West as modified in view of Konuma above includes all that is recited in claim 6 except for a drive voltage of 20V or less applied across the paired transparent electrodes.

As shown in Fig. 1, Gotoh discloses a chiral nematic liquid crystal optical element comprising a pair of electrodes 12 driven by a low applied voltage to realize excellent hysteresis characteristics (col. 2, lines 23-26). According to examples 1-11, the applied drive voltage is less than 20V (cols. 11-17).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the chiral nematic liquid crystal optical

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element of West with the teaching of Gotoh by applying a low voltage across the pair electrodes to obtain excellent hysteresis characteristics (col. 2, lines 23-26).

8. Claims 7, 19, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over West (West, USPN 5,453,863) in view of Konuma et al. (Konuma, USPN 5,856,853) as applied to claims 5 and 23 above and further in view of JP 08-220326 (JP'326).

Re claim 7, West in view of Konuma discloses a liquid crystal optical element that is basically the same as that recited in claim 7 except for a resin layer having a surface hardness of B or less.

JP'326 discloses a polyimide contact layer having a pencil hardness of less than HB formed on a color filter substrate to improve adhesion property and maintain high transparency (See Abstract, Table 1 and paragraph 47).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the liquid crystal optical element of West with the teaching of JP'326 by forming on the other electrode a resin layer having a surface hardness of B or less to improve adhesion property and maintain high transparency for the display (see Abstract).

Re claim 22, according to Table 1 of the current invention, the resin layer having a pencil hardness of B or less prevents image-sticking, thus, it is obvious that the resin layer of JP'326 having a pencil hardness of less than HB also prevents image-sticking.

Re claim 19, the resin layer of JP'326 comprises a polyimide as indicated above. However, as to the product-by-process limitation "a polyimide which has been baked," it

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has been recognized that "Even through product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior art product was made by a different process". *In re Thorpe*, 227 USPQ 964,966 (Fed. Cir. 1985). See also MPEP 2113.

Re claim 21, West discloses that the resin layer may be a non-alignment layer of a resin surface since it is unrubbed (col. 7, lines 2-7).

9. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over West et al. (West, USPN 5,453,863) in view of Konuma et al. (Konuma, USPN 5,856,853) and Gotoh et al. (Gotoh, USPN 5,674,576) as applied to claim 6 above and further in view of JP 08-220326 (JP'326).

West in view of Konuma and Gotoh discloses a liquid crystal optical element that is basically the same as that recited in claim 8 except for a resin layer having a surface hardness of B or less.

JP'326 discloses a polyimide contact layer having a pencil hardness of less than HB formed on a color filter substrate to improve adhesion property and maintain high transparency (See Abstract, Table 1 and paragraph 47).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the liquid crystal optical element of West with the teaching of JP'326 by forming on the other electrode a resin layer having a

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surface hardness of B or less to improve adhesion property and maintain high transparency for the display (see Abstract).

10. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over West et al. (West, USPN 5,453,863) in view of JP 08-220326 (JP'326) as applied to claims 3, 4, 14, 16 and 17 above further in view of Khan et al. (Khan, USPN 6,377,321 B1).

West in view of JP'326 discloses a chiral nematic liquid crystal optical element that is basically the same as that recited in claim 15 except for a first electrically insulating layer which is coated on at least one of the electrodes and a second electrically insulating layer which is coated on the other electrodes, wherein said first and said second electrical insulating layers are coated on said electrically insulating layers.

As shown in Fig. 6, Khan discloses a chiral nematic liquid crystal optical element 42 comprising electrodes 56 and insulating layers 58 (passivation layers) coated on the electrodes to prevent front to back shorting of the electrodes, wherein alignment layers 60 are coated on said electrically insulating layers (col. 11, lines 42-58).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the chiral nematic liquid crystal optical element of West with the teaching of Khan by coating the insulation layers on the electrodes to prevent front to back shorting of the electrodes (col. 11, lines 50-52).

11. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over West et al. (West, USPN 5,453,863) in view of Konuma et al. (Konuma, USPN 5,856,853) and

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JP 08-220326 (JP'326) as applied to claims 7, 19, 21 and 22 above and further in view of Khan et al. (Khan, USPN 6,377,321 B1).

West in view of Konuma and JP'326 discloses a chiral nematic liquid crystal optical element that is basically the same as that recited in claim 20 except for a first electrically insulating layer which is coated on at least one of the electrodes and a second electrically insulating layer which is coated on the other electrodes, wherein said first and said second electrical insulating layers are coated on said electrically insulating layers.

As shown in Fig. 6, Khan discloses a chiral nematic liquid crystal optical element 42 comprising electrodes 56 and insulating layers 58 (passivation layers) coated on the electrodes to prevent front to back shorting of the electrodes, wherein alignment layers 60 are coated on said electrically insulating layers (col. 11, lines 42-58).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the chiral nematic liquid crystal optical element of West with the teaching of Khan by coating the insulation layers on the electrodes to prevent front to back shorting of the electrodes (col. 11, lines 50-52).

Response to Arguments

12. Applicant's arguments filed May 13, 2005 have been fully considered but they are not persuasive.

Applicant argued that West does not disclose or suggest a material having vertical alignment capability. Instead, West merely discloses that the resin layers on opposite substrates are rubbed in parallel or perpendicular with respect to each other.

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The Examiner disagrees with Applicant's remarks since West discloses that the cell wall structure is treated to homeotropically (or vertically) align the liquid crystal, where the cell wall comprises surface treatment layers 14 as shown in Fig. 1 for altering the characteristics of the cell response (col. 5, lines 36-44; col. 6, line 66 through col. 7, line 9; and col. 14, lines 35-37). Thus, the resin layers of West are vertical alignment layers which may be rubbed in different directions (parallel or perpendicular) with respect to each other (col. 7, lines 6-9).

Applicant also argued that JP 08-220326 (JP'326), Khan, Konuma and Gotoh fail to cure the defects of West because there is no vertical alignment layer as claimed. The Examiner disagrees since West discloses vertical alignment layer as indicated above.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

In this case, JP'326 is employed for teaching a polyimide resin layer having a surface hardness of B or less to improve adhesion property and maintain high transparency for the display. Further, Khan is employed for teaching insulation layers coated on the electrodes to prevent front to back shorting of the electrodes.

Furthermore, Konuma is employed for providing a metal oxide layer on at least one of

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the transparent electrodes to prevent short-circuiting between electrodes. Finally, Gotoh is employed for applying a low voltage across the pair electrodes to obtain excellent hysteresis characteristics.


Conclusion

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thoi V. Duong whose telephone number is (571) 272-2292. The examiner can normally be reached on Monday-Friday from 8:30 am to 4:30 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim, can be reached at (571) 272-2293.

Thoi Duong
07/28/2005



DUNG T. NGUYEN
PRIMARY EXAMINER